

RHIC 2003 – 2004 Physics Run

Daily Quench Analysis for the month of January 2004

Start of the RHIC Physics Run fy04

Thur-January 01 **Yellow PR-001 File#** = 1072958793 (Loc: 4b-time.B) **Timestamp: 07:06:32 +1132050**
Beam Permit Fail Timestamp: 07:04:28 +646612 down prior to QLI
Quench Detector(s) Trip: All indicating Positive Tq values.
5 Minute Real Quench Delay File: None indicated.
Beam Loss Monitors (Rads/Hr): Aborted prior to QLI.
Main Magnet Power Status: Ramping down from Store Energy, tripping at 2100 amps at T=zero. Postmortem Plots indicate ps-psgnd (y1) +10 amps and ps-qgnd (y1) -10 amps approx -2.0 seconds prior to T=zero.
Main Magnet Control Page: Fail due to PS Ground Current Trip.

Technical Notes: Jan 1 2004 7:03: Dumping Beam and ramping down Sequencer
Jan 1 2004 7:04: Beam Abort, 8b-ps1 dropped {Loss Monitor 1} Sequencer
Jan 1 2004 7:06: Quench Link Interlock in Yellow ring, 4b-time.B dropped first Sequencer
Jan 1 2004 9:04: Link pulled by YD Ground Current Trip. Postmortem shows ground current on the power supply and quench grounds. I don't understand the current on the quench ground. I watched the ground currents during the next ramp, they looked good. I will have to watch this, may instrument some points in the circuit on the next maintenance day. CS
Jan 1 2004 11:04: It looks like the positive quench protection crowbar SCR triggered on the down ramp. I see no large ps voltages that could cause the self trigger circuit to fire. Ganetis [quench]
QLI Recovery / PS On Checks Commenced: 07:44:12

Delay Time: 40 minutes

Quench Analysis: Yellow Main Dipole, Ground Current

Thur-January 01 **Blue PR-002 File#**=1073005569 (Loc: 12a-ps1.A) **Timestamp: 20:06:08 +1311155**
Beam Permit Fail Timestamp: 20:06:08 +1271785 Tripped first.
Quench Detector(s) Trip: (12a-qd1) B11QFQ2_VT, Int. 1, Tq= -24
Dx Heaters Fired: Normal operating indications.
QPA Control / TR 1st Alarm: No faults indicated.
Postmortem Plots: Power supplies not the cause for this event.
5 Minute: Quench Delay File: (12a-qd1) B11QFQ2_VT
Beam Loss Monitors (Rads/Hr): Most significant reading, g11-lm21 (1836), g11-lm20 (580), g10-lm1 (3747) and b11-lmo (1029)
Main Magnet Power Status: Store Energy.

Technical Notes: 20:06: Beam Abort, 5e-ps2.A dropped {Loss Monitor 1} Sequencer
20:06: Quench Link Interlock in Blue ring, 12a-ps1.A dropped first Sequencer
20:44: blue quench link trip was caused by 12a-qd1 quench detector. The quench detector tripped because of a real magnet quench at B11QFQ2_VT. The beam permit tripped .040 sec. before the blue quench link. There was a real magnet quench at b11q2. There was a high loss at b11-lm1. There is now 14 beam induced quench link trips for this run. Ganetis [quench]
QLI Recovery / PS On Checks Commenced: 20:44:58

Delay Time: 39 minutes

Quench Analysis: Beam Induce 014

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Thur-January 01 **Blue PR-003 File#**=1073007883 (Loc: 12a-ps1.A) **Timestamp: 20:44:40 +3370854**

Beam Permit Fail Timestamp: Down from previous PR-002 QLI

Quench Detector(s) Trip: All Running.

Dx Heaters Fired: Normal operating indications.

QPA Control / TR 1st Alarm: bo11-qf8-qp, no faults indicated.

Postmortem Plots: N/A, power supplies recovering, levels to low.

5 Minute: Quench Delay File: None indicated.

Beam Loss Monitors (Rads/Hr): No beam in the machine at the time.

Main Magnet Power Status:

Technical Notes: Alarm Log indicated that bo11-qf8 remained in Standby/Error after quench recovery program had tried to reset.

20:44: Quench Link Interlock in Blue ring, 12a-ps1.A dropped first **Sequencer**

20:58: The bo11-qf8 supply showed an *error signal* fault on AD2000. **jak**

21:02: blue quench link trip was caused by bo11-qf8-ps when it was turned on during quench recovery. The ps had an error fault. The aux. contact will have to be replaced during the next maintenance period. **Ganetis [quench]** 20:50: Blue quench recovery sequence begun **tape** □ 21:09: This is the main ps turn on current over-shoot. This had nothing to do with the blue link trip. See comments at time of link trip. **Ganetis**

21:10: Cryo has given permission to ramp RHIC. Commencing hysteresis ramp.

QLI Recovery / PS On Checks Commenced: **20:59:01**

Delay Time: 15 minutes

Quench Analysis: bo11-qf8-ps, error on recovery

Fri-January 02 **Yellow PR-004 File#**= 1073059221 (Loc: 8b-ps1) **Timestamp: 11:00:20 +1595637**

Beam Permit Fail Timestamp: **11:00:20 +1525980**

Quench Detector(s) Trip: (8b-qd2) Y8QFQ2_VT, Int. 1, Tq -24

5 Minute Real Quench Delay File: (8b-qd2) Y8QFQ2_VT and Y8QFQ3_VT. Qdplots also shows these two (raw) signals responding as real magnet quenches.

Beam Loss Monitors (Rads/Hr): Most significant reading, b8-lm0 (**553**), y8-lm0 (**2178**), g8-lm1 (**3616**), b8-lm3.1 (**2601**) and y8-lm3.1 (**4578**)

Postmortem Plots: Power Supplies not the cause for this event.

Main Magnet Power Status: Store Energy

Technical Notes: **11:00:** Quench Link Interlock in Yellow ring, 8b-ps1 dropped first **Sequencer**

11:39: yellow quench link trip was caused by 8b-qd2 quench detector. The quench detector tripped because of a real magnet quench at Y8QFQ2_VT. The beam permit tripped 70 msec. before the quench link. There were two real quench at y8q2 and y8q3. There was high beam loss at g8-lm1 and y8-lm3.1. There is now 15 beam induced quenches for this run. Also all three y8 tq's had bus quenches about 65 sec after the q2 and q3 quenched.

Ganetis [quench]

QLI Recovery / PS On Checks Commenced: **11:40:48**

Delay Time: 48 minutes

Quench Analysis: Beam Induce 015

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Sat-January 03 **Yellow PR-005 File#** = 1073137942 (Loc: 4b-time.B) **Timestamp: 08:52:20 +2251442**

Beam Permit Fail Timestamp: 08:15:28 +2453954

Quench Detector(s) Trip: No negative Tq values.

5 Minute Real Quench Delay File: None indicated.

Beam Loss Monitors (Rads/Hr): N/A

Postmortem Plots: Yellow Dipole shows ps and q ground signals occurring 2 seconds before T=zero.

Main Magnet Power Status: Ramping down from Store Energy, tripping at 5000 amps.

Main Magnet Control Page: y-dipole main, PS Ground Current Trip.

Technical Notes: 8:52: Quench Link Interlock in Yellow ring, 4b-time.B dropped first **Sequencer**

19:02: yellow quench link trip was caused by yellow main dipole ps. The ps had a ground fault. The ground fault was caused by the positive quench protection crowbar SCR suddenly conducting. **Ganetis** [**quench**]

QLI Recovery / PS On Checks Commenced: 12:16:01 (User Exit)

Delay Time: 204 minutes

Quench Analysis: y-dipole main, PS Ground Current Trip.

Sat-January 03 **Blue PR-006 File#** = 10733137944 (Loc: 4b-time.B) **Timestamp: 08:52:24 +410995**

Beam Permit Fail Timestamp: 08:15:28 +2453954 (Down from previous QLI)

Quench Detector(s) Trip: No negative Tq values.

5 Minute Real Quench Delay File: None indicated.

Beam Loss Monitors (Rads/Hr): N/A

Postmortem Plots: Blue Dipole shows ps and q ground signals occurring 2 seconds before T=zero.

Main Magnet Power Status: Ramping down from Store Energy, tripping at 4941 amps.

Main Magnet Control Page: b-dipole main, PS Ground Current Trip.

Technical Notes: 8:52: Quench Link Interlock in Blue ring, 4b-time.B dropped first **Sequencer**

18:59: blue quench link trip was caused by blue main dipole ps. The ps had a ground fault. The ground fault was caused by both quench protection crowbar SCR suddenly conducting. This caused a sudden decrease in the ramp module current. This is the first time I have seen this fault on the blue ps. **Ganetis**

9:07: While running a hysteresis ramp, we receive a quench link interlock from both the blue and yellow rings. 4b-time.B gives the indication.

10:15: Both rings went on ground current trips. Each ring shows the power supply ground current and quench ground current jumping up before the trip. This is similar to an earlier trip. The Blue Ring shows a drop in the LEM current from the Ramp Power Module at the same time the ground currents begin. I will investigate during the next maintenance day unless this begins occurring more often. **CS**

QLI Recovery / PS On Checks Commenced: 09:20:56

Delay Time: 28 minutes

Quench Analysis: b-dipole main, PS Ground Current Trip.

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Sat-January 03 **Yellow PR-007 File#** = 1073164607 (Loc: 4b-time.B) **Timestamp: 16:16:44 +3197504**

Beam Permit Fail Timestamp: 16:16:44 +3197534

Quench Detector(s) Trip: No negative Tq values.

5 Minute Real Quench Delay File: None indicated.

Beam Loss Monitors (Rads/Hr): N/A

Postmortem Plots: IR Power Supplies not the cause for this event.

Main Magnet Power Status: Ramping down from Store Energy, tripping at 2072 amps.

Main Magnet Control Page: y-dipole main, PFN1 and PFN2 Fault

Technical Notes: 16:14: Dumping Beam and ramping down [Sequencer](#)

16:16: Quench Link Interlock in Yellow ring, 4b-time.B dropped first [Sequencer](#)

16:16: Beam Abort, 4b-time.B dropped { Yellow Main PS } Quench [Sequencer](#)

16:29: We were ramping down and beam had already been ejected from the machine when the quench link interlock occurred.

19:03: yellow quench link trip was caused by yellow main dipole ps. The ps had a PFN1 fault and PFN2 fault. [Ganetis](#)

17:28: This time the errors PFN1Fault and PFN2Fault brought the link down. The Postmortem shows the ground currents start at a time consistent with the delay for these errors built into the PLC code. The Postmortem also showed the LEM power module current going to zero 60 msec after the trip, this may indicate the PFN circuits fired without a quench signal. The trips are only happening on down ramps, last time it happened to both dipoles. The downramp is faster than it was, is there a power problem now that we are going faster? Last year we drove the power line -11% (I think) during the downramp. I will request the Dranitz be installed at 1004B. [CS19:16:](#) Carl, one thing in common to these crowbar SRC turning on and the PFN faults is your quench interface board. Could the problem be in it? [Ganetis](#)

QLI Recovery / PS On Checks Commenced: 16:40:08 (User Exit)

Delay Time: 24 minutes

Quench Analysis: y-dipole main, PFN1 and PFN2 Fault.

Sat-January 03 **Blue PR-008 File#** = 1073168364 (Loc: 4b-time.A) **Timestamp: 17:19:24 +530133**

Beam Permit Fail Timestamp: 17:19:24 +530163

Quench Detector(s) Trip: No negative Tq values.

5 Minute Real Quench Delay File: None indicated.

Beam Loss Monitors (Rads/Hr): N/A

QPA Control / TR 1st Alarm: bo3-qd7-qp, Fan Fault.

Main Magnet Power Status: Injection Current.

Technical Notes: 17:19: Quench Link Interlock in Blue ring, 4b-time.A dropped first [Sequencer](#)

17:19: Beam Abort, 4b-time.A dropped Blue Quench [Sequencer](#)

19:09: blue quench link trip was caused by a fan fault in bo3-qd7-qp. (quench protection assembly) [Ganetis](#)

17:23: QLI in blue from 4b-time.A. This quench occurred at injection as we were trying to fill the yellow ring. [LH](#)

17:26: The quench does not appear to be beam induced, and cryo reports seeing no elevated temperatures. [LH](#)

QLI Recovery / PS On Checks Commenced: 17:29:27

Delay Time: 10 minutes, recover but fails a second time, see next QLI, PR-009.

Quench Analysis: bo3-qd7-qp, QPA Fan Fault (2 Air Vane Switches replaced).

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Sat-January 03 **Blue PR-009 File#** = 1073168958

(Loc: 4b-time.A)

Timestamp: 17:29:16 +2896464

Beam Permit Fail Timestamp: 17:29:16 +2896494

Quench Detector(s) Trip: No negative Tq values.

5 Minute Real Quench Delay File: None indicated.

Beam Loss Monitors (Rads/Hr): N/A

QPA Control / TR 1st Alarm: bo3-qd7-qp, Fan Fault.

Main Magnet Power Status: Zero Current

Technical Notes: 17:29: Beam Abort, 4b-time.A dropped Blue Quench Sequencer

17:29: Quench Link Interlock in Blue ring, 4b-time.A dropped first Sequencer

19:12: blue quench link trip was caused by a fan fault in bo3-qd7-qp. (quench protection assembly) This is the second time for this fault. Ganetis

22:24: I got a call from MCR on this and I had CAS (Chris Z and Joe C) replace the qpa fan switches on the bo3-qd7 qpa. They did a very nice job. We have a problem with these qpa fan switches because they are not sealed so they get dirty and become resistive. We are searching for new switches so we can replace all the qpa fan switches during the summer shutdown and not have this problem anymore. Don Bruno

QLI Recovery / PS On Checks Commenced: 18:49:59

Delay Time: 81 minutes (Note: Total Machine Down Time for related QLI PR-008 & PR-009 equals 91 minutes)

Quench Analysis: bo3-qd7-qp, QPA Fan Fault (2 Air Vane Switches replaced).

Sun-January 04 **Yellow PR-010 File#** = 1073225195

(Loc: 4b-time.B)

Timestamp: 09:06:32 +3251544

Beam Permit Fail Timestamp: 09:06:32 +3251544

Quench Detector(s) Trip: No negative Tq values.

5 Minute Real Quench Delay File: None indicated.

Beam Loss Monitors (Rads/Hr): N/A

Postmortem Plots: IR Power Supplies not the cause for this event.

Main Magnet Power Status: Ramping up from Injection Current, tripped at 1012 amps.

Main Magnet Control Page: y-dipole main, PFN1 and PFN2 Fault

Technical Notes: 9:06: Quench Link Interlock in Yellow ring, 4b-time.B dropped first Sequencer

9:06: Beam Abort, 4b-time.B dropped { Yellow Main PS } Quench Sequencer

9:28: After speaking to Wolfram, we believe that the quench link interlock may be related the yellow mains. We have called C. Schultheiss to investigate.

10:14: yellow main dipole ps had pfn1 and pfn2 faults. Ganetis

10:17: This interlock was caused by a PFN1Fault and PFN2Fault. This occurred on the up ramp. There was no sign of ground current as there was yesterday. This seems to indicate there are two separate problems. Since the frequency of the incidents is growing I would like to take time to test and instrument the Yellow Dipole tomorrow. CS

QLI Recovery / PS On Checks Commenced: 09:42:30 (User Exit)

Delay Time: 36 minutes

Quench Analysis: y-dipole main, PFN1 and PFN2 Fault.

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Sun-January 04 **Yellow PR-011 File#** = 1073249218 (Loc: 4b-time.B) **Timestamp: 15:46:56 +2698190**

Beam Permit Fail Timestamp: 15:46:56 +2698220

Quench Detector(s) Trip: No negative Tq values.

5 Minute Real Quench Delay File: None indicated.

Beam Loss Monitors (Rads/Hr): N/A

Postmortem Plots: Yellow Dipole shows ps and q ground signals occurring 2 seconds before T=zero.

Main Magnet Power Status: Ramping down from Store Energy, tripping at 3390 amps.

Main Magnet Control Page: y-dipole main, PS Ground Current Trip.

Technical Notes: 15:37: Dumping Beam and ramping down Sequencer

15:47: Quench Link Interlock in Yellow ring, 4b-time.B dropped first Sequencer

15:47: Beam Abort, 4b-time.B dropped { Yellow Main PS } Quench Sequencer

16:03: cfe-3a-ps1 requires a reboot before we can ramp down. Error&Stop command issued in sequencer, and we restarted the down ramp. MCR

16:59: It looks like the yellow dipole main tripped the link on a ground current fault. Don Bruno

22:11: The ground current was caused by the positive quench protection crowbar SRC turning on. Ganetis

QLI Recovery / PS On Checks Commenced: 16:44:02 (User Exit)

Delay Time: 57 minutes

Quench Analysis: y-dipole main, PS Ground Current Trip.

Sun-January 04 **Blue PR-012 File#** = 1073249220 (Loc: 4b-time.B) **Timestamp: 15:47:00 +871114**

Beam Permit Fail Timestamp: 15:46:56 +2698220 (Down from previous QLI)

Quench Detector(s) Trip: No negative Tq values.

5 Minute Real Quench Delay File: None indicated.

Beam Loss Monitors (Rads/Hr): N/A

Postmortem Plots: Blue Dipole shows ps and q ground signals occurring 2 seconds before T=zero.

Main Magnet Power Status: Ramping down from Store Energy, tripping at 3315 amps.

Main Magnet Control Page: b-dipole main, PS Ground Current Trip.

Technical Notes: 15:47: Quench Link Interlock in Blue ring, 4b-time.B dropped first Sequencer

17:01: It looks like the main blue dipole p.s. tripped the link on a ground current fault. Carl should look at this trip and the yellow that happened at the same time. I am not as familiar with this as he is. I compared the yellow and blue trips that just happened, with the Postmortem plots of the trip that happened on 1/3/04 at 8:52. The trip on 1/3/04 looks a little different than today's trip but I think that is because they tripped at different points on the ramp down. Both trips do show ground currents. I told MCR to go ahead and try to recover and ramp. Don Bruno

22:13: The blue dipole ground current trip was caused by both positive and negative quench protection crowbar SCR turning on. Ganetis [quench]

16:03: Both yellow and blue rings show QLI in a familiar pattern, originating from 4b-time.B, occurring on the down ramp, and accompanied by a *ground current warning* indication. This time, there is no PFN fault.

Attempts to reach Carl on the phone have been unsuccessful, so we contact Don Bruno, as instructed for *ground current warning* alarms. LH

QLI Recovery / PS On Checks Commenced: 16:24:38

Delay Time: 37 minutes

Quench Analysis: b-dipole main, PS Ground Current Trip.

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Mon-January 05 **Yellow PR-013 File#** = 1073304665 (Loc: 4b-time.B) **Timestamp: 07:11:04 +1870445**

Beam Permit Fail Timestamp: **07:08:56 +2635365**

Quench Detector(s) Trip: No negative Tq values.

5 Minute Real Quench Delay File: None indicated.

Beam Loss Monitors (Rads/Hr): N/A

Postmortem Plots: Yellow Dipole shows ps and q ground signals occurring 2 seconds before T=zero.

Main Magnet Power Status: Ramping down from Store Energy, tripping at 3096 amps.

Main Magnet Control Page: y-dipole main, PS Ground Current Trip.

Technical Notes: **7:08:** Dumping Beam and ramping down **Sequencer**

7:09: Beam Abort, 5e-ps2.A dropped {Loss Monitor 1} **Sequencer**

7:11: Quench Link Interlock in Yellow ring, 4b-time.B dropped first **Sequencer**

8:21: yellow quench link trip caused by yellow main dipole p.s. . The p.s. had a ground fault. The ground fault was caused by the positive quench protection crowbar SCR turning on. **Ganetis**

QLI Recovery / PS On Checks Commenced: **07:27:33 (User Exit)**

Delay Time: 16 minutes

Quench Analysis: y-dipole main, PS Ground Current Trip.

Mon-January 05 **Blue PR-014 File#** = 1073326728 (Loc: 4b-time.A)

Timestamp: 13:18:48

Mon-January 05 **Yellow PR-015 File#** = 1073326741 (Loc: 4b-time.A)

Timestamp: 13:19:00

Beam Permit Fail Timestamp: Down prior to bringing the links down.

Quench Detector(s) Trip: No negative Tq values.

Main Magnet Power Status: MCR brought power supplies to zero current.

Technical Notes:

13:37: Brought both Links down by setting b-qtrim and y-qtrim to Off once main current levels had reached zero amps for work on the Main Power Supplies. **Heppner [rhic]**

QLI Recovery / PS On Checks Commenced: **Blue = 18:38:54**

Yellow = 19:13:04

Delay Time: N/A, see next QLI PR-016

Quench Analysis: Brought down both Links for Scheduled Maintenance.

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Mon-January 05 **Yellow PR-016 File#** = 1073345325 (Loc: 4b-time.B) **Timestamp: 18:28:44 +1516551**
Beam Permit Fail Timestamp: Down from PR-014 & PR-015, Maintenance
Quench Detector(s) Trip: N/A
5 Minute Real Quench Delay File: None indicated.
Main Magnet Power Status: Park Current.
Main Magnet Control Page: y-dipole main, PFN1 and PFN2 Fault

Technical Notes:

19:46: The Yellow Dipole was instrumented to gain some understanding of the ground current trips that have been occurring. Data will be automatically collected on time B trips of the Yellow Dipole. Points were also brought out on the Blue Dipole, but these are not presently monitored. This trip was deliberate and tested the data acquisition system. **CS**

QLI Recovery / PS On Checks Commenced: **19:13:04**

Delay Time: 354 minutes

Quench Analysis: y-dipole main, Instrumentation added.

Tues-January 06 **Blue PR-017 File#**=1073385621 (Loc: 6b-ps1) **Timestamp: 05:40:20 +1360405**
Beam Permit Fail Timestamp: **05:40:20 +1360435**
Quench Detector(s) Trip: (6b-qd1) B5QFQ2_VT, Int. 1, Tq= -24
Dx Heaters Fired: Normal operating indications.
QPA Control / TR 1st Alarm: No faults indicated, b-QD QLI BI1, 1st indicated.
Postmortem Plots: Power supplies not the cause for this event.
5 Minute: Quench Delay File: (6b-qd1) B5QFQ2_VT
Beam Loss Monitors (Rads/Hr): Most significant reading, b5-lm3.1 (**308**), g5-lm1 (**92**) for several seconds and b5-lm0 (**52**).
Main Magnet Power Status: Store Energy.
Qdplots: Indicates that B5QFQ2 signal had in fact quenched.

Technical Notes: 05:40: (MCR) blue QLI occurred while attempting to remove the debunched beam from the ring. This appeared to be a beam induced quench according to the PMViewer plots.

Jan 6 2004 8:50: blue quench link trip was caused by 6b-qd1 quench detector. The quench detector tripped because of a real magnet quench at B5QFQ2_VT. The beam permit tripped after the quench link. There was one real quench at b5q2. There was low beam loss at g5-lm1 of approx. 80 rads/hr that lasted for many seconds. There is now 16 beam induced quenches for this run. **Ganetis [quench]**.

QLI Recovery / PS On Checks Commenced: **06:04:04**

Delay Time: 24 minutes

Quench Analysis: Beam Induce 016

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Tues-January 06 **Blue PR-018 File#**=1073386980 (Loc: 12a-ps1.A) **Timestamp: 06:03:00 +368927**
Beam Permit Fail Timestamp: 05:40:20 +1360435 (Down from previous QLI, PR-017)
Quench Detector(s) Trip: Running
Dx Heaters Fired: Normal operating indications.
QPA Control / TR 1st Alarm: No faults indicated, bo11-qf8-qp, 1st indicated.
5 Minute: Quench Delay File: None initiated.
Beam Loss Monitors (Rads/Hr): N/A
Main Magnet Power Status: Park Current.

Technical Notes: 8:56: Blue quench link trip was caused by bo11-qf8-ps when the p.s. was being turned on. The p.s. had an error fault. The Aux. contacts on this p.s. need to be replaced. Ganetis [quench]

QLI Recovery / PS On Checks Commenced: 06:12:45

Delay Time: 10 minutes

Quench Analysis: bo11-qf8-ps, faulty Auxiliary Contactor.

Tues-January 06 **Yellow PR-019 File#** = 1073405545 (Loc: 5b-ps1) **Timestamp: 11:12:24 +1262976**
Beam Permit Fail Timestamp: 10:11:20, aborted due to 7c-ps3 not communicating.
Quench Detector(s) Trip: Multiple, all yellows are indicating negative Tq values, (5b-qd1) Y4QFA3_A2VT, Int1, Tq -24
5 Minute Real Quench Delay File: None initiated.
Main Magnet Power Status: Store Current.
Main Magnet Control Page: No faults indicated.

Technical Notes:

MCR: 10:00: Loss monitors pulled the permit link. We can't ramp down because of a communication problem with 7c-ps3. Contacting controls.

10:45: A ring access is required to fix 7c-ps3. Turning off critical devices.

13:05: The yellow quench link trip at 11:12:25.26 is not recorded in the e-log. This trip was caused by a dip in the current signal of the yellow main quad p.s. Carl S. was investigating something in the Output Circuit Compartment at that time and inadvertently caused the current signal to change. Ganetis [quench]

13:39: The yellow quench recovery was started when the yellow sextupoles were at high current. When you reset the quench detector it can cause a glitch that will trip the Aux. circuit that the sextupoles are on. This caused all the sxd to trip. The sextupole were still at high current when they should have been at zero current. Ganetis [quench]

QLI Recovery / PS On Checks Commenced: 12:54:41

Delay Time: 102 minutes

Quench Analysis: y-quad main, current signal dip.

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Tues-January 06 **Blue PR-020 File#**=1073424782 **(Loc: 12a-ps1.A)** **Timestamp: 16:33:00 +2737652**

Beam Permit Fail Timestamp: 16:33:00 +2682574

Quench Detector(s) Trip: All tripped, two indicating negative Tq values

(12a-qd1) B11QFQ2_VT, Int. 1, Tq= -24

(10a-qd1) B10QFQ4_6VT, Int 1, Tq= -13

Dx Heaters Fired: Normal operating indications.

QPA Control / TR 1st Alarm: No faults indicated, b-QD QLI BI1, 1st indicated.

Postmortem Plots: Power supplies not the cause for this event.

5 Minute: Quench Delay File: (12a-qd1) B11QFQ2_VT and (10a-qd1) B10QFQ4_6VT

Beam Loss Monitors (Rads/Hr): Sector 10 indicates multiple significant losses starting at the Abort Kicker. These losses proceed past the Dump Region thru y10-lm4 (**4699**), b10-lm4 (**4970**), g10-lm5 (**4620**), g10-lm6 (**4739**), g10-lm7 (**3107**), g10-lm8 (**675**), g10-lm12 (**4860**), g10-lm16 (**2573**) and g10-lm20 (**5151**). Sector 11 continues the loss thru g11-lm21 (**3366**), g11-lm20 (**1009**), g11-lm18 (**1619**) and g11-lm14 (**524**). Normal values occur until detector b11-lm3.1 (**710**), most significant at g11-lm1 (**4706**) and b11-lm0 (**1553**). These indicate that a dirty Dump had occurred in this area.

Main Magnet Power Status: Store Energy.

Qdplots: Indicates that B11QFQ2 and B10QFQ4_6 signal had in fact quenched.

Technical Notes MCR Comment at **16:33:** Blue QLI. The beam dump is not clean. The cause is under investigation.

16:59: blue quench link trip was caused by 12a-qd1 quench detector. The quench detector tripped because of a real magnet quench at B11QFQ2_VT. The beam permit tripped 55 msec. before the quench link. There were two real quench at b11q2 and b10q4. There was high beam loss at g11-lm1 and b10-lm4. There was moderate beam loss at b11-lm3.1. There is now 17 beam induced quenches for this run. [Ganetis \[quench \]](#)

QLI Recovery / PS On Checks Commenced: 17:50:20

Delay Time: 77 minutes

Quench Analysis: Beam Induce 017

Tues-January 06 **Yellow PR-021 File#** = 1073437581 **(Loc: 4b-time.B)** **Timestamp: 20:06:20 +1017456**

Beam Permit Fail Timestamp: 20:04:04 +857688

Quench Detector(s) Trip: All tripped, no negative Tq values.

5 Minute Real Quench Delay File: None initiated.

Beam Loss Monitors (Rads/Hr): Appeared to be a normal Abort.

Postmortem Plots: Yellow Dipole shows ps and q ground signals occurring 2 seconds before T=zero.

Main Magnet Power Status: Ramping down from Store Energy, tripping at 1762 amps.

Main Magnet Control Page: y-dipole main, PS Ground Current Trip.

Technical Notes: **22:40:** yellow quench link trip was caused by yellow main dipole ps. The ps had a ground fault. The ground fault was caused by the positive quench protection crowbar SCR suddenly conducting. [Ganetis \[quench \]](#)

QLI Recovery / PS On Checks Commenced: 20:30:40 (User Exit)

Delay Time: 24 minutes

Quench Analysis: y-dipole main, PS Ground Current Trip.

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Wed-January 07 Blue PR-022 File# = 1073478096 (Loc: 4b-time.A) Timestamp: 07:21:36

Wed-January 07 Yellow PR-023 File# = 1073478105 (Loc: 4b-time.A) Timestamp: 07:21:44

Beam Permit Fail Timestamp: Down prior to bringing the links down.

Quench Detector(s) Trip: No negative Tq values.

Main Magnet Power Status: MCR brought power supplies to zero current.

Technical Notes: 8:06: Brought down both links by placing b-qtrim and y-qtrim to Off condition after Main Current levels had reached zero for maintenance day. heppner [rhic]

QLI Recovery / PS On Checks Commenced: Blue = 17:50:20

Yellow = 18:50:27

Quench Analysis: Brought down both Links for Scheduled Maintenance.
Time allocated 0700 to 1500, (480 minutes).

Wed-January 07 Blue PR-024 File# = 1073518168 (Loc: 4b-time.B) Timestamp: 18:29:28 +868209

Beam Permit Fail Timestamp: Still down from this morning.

Technical Notes: 18:29: Quench Link Interlock in Blue ring, 4b-time.B dropped first Sequencer

18:32: Blue quench recovery sequence begun tape

18:42: Yellow quench recovery sequence begun tape

19:01: Beam is accelerating in the AGS. George, Carl and Wing are ramping the magnets. Looks like they are performing a hysteresis ramp.

20:44: RHIC acceleration ramp started, ramp id Au4_1073524556 Sequencer

Maintenance had exceeded and now we return to Physics.

QLI Recovery / PS On Checks Commenced: (see delay time for details)

Delay Time: (Extended Maint.) 504 minutes, Maintenance Officially ended with RHIC acceleration ramp started, ramp id Au4_1073524556minutes

Quench Analysis: Recovery from Maintenance.

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Wed-January 07 **Blue PR-025 File#**=1073526413 (Loc: 12a-ps1.A) **Timestamp: 20:46:52 +1871384**

Beam Permit Fail Timestamp: 20:46:52 +1871413

Quench Detector(s) Trip: (12a-qd1) B12DRDX_VT, Int 20, Tq= -23

Dx Heaters Fired: Normal operating indications.

QPA Control / TR 1st Alarm: No faults indicated, b-QD QLI BI1, 1st indicated.

5 Minute: Quench Delay File: None initiated.

Beam Loss Monitors (Rads/Hr): N/A

Main Magnet Power Status: Ramping towards Store, tripping at: Dipole = 2972amps, Quad = 2806amps.

Technical Notes: 22:07: I think the quench detector pulled the link because of a problem with the b12-dhx power supply. There may be a problem with the 3-channel isolation amplifier board. I will call CAS and prepare them in case it happens again. [Don Bruno](#)

22:29: blue quench link trip was caused by 12a-qd1-quench detector. The beam permit tripped after the quench link. The quench detector tripped because of a jump in the current signal in b12-dx-ps. There was not a real change in current signal because there was no change in magnet voltage as seen on the quench detector. There were changes in the voltage signal on the postmortem plots but no corresponding change in magnet voltage. The problem looks like a buffer card problem. [Ganetis](#)

22:41: If one looks closely you will see a sudden decrease in ps voltage at -.38 sec. This is not normal. [Ganetis](#)

QLI Recovery / PS On Checks Commenced: 21:14:39

Delay Time: 28 minutes

Quench Analysis: b12-dhX-ps, possible Internal 3 channel Isolation Amp Board.

Thurs-January 08 **Yellow PR-026 File#** = 1073538279 (Loc: 10a-ps3.A) **Timestamp: 00:04:36 +3939802**

Beam Permit Fail Timestamp: 00:04:36 +3939831

Quench Detector(s) Trip: All tripped, no negative Tq values.

5 Minute Real Quench Delay File: None initiated.

Beam Loss Monitors (Rads/Hr):

Postmortem Plots: Power supply did not cause this event.

Main Magnet Power Status: Injection Current.

Main Magnet Control Page: Normal conditions.

Technical Notes: 00:49: The yellow mains did not come up to park the first time the quench recovery was used. We ran the script again, and we had the same problem. It appears that the quench permit did not clear for 10a-ps3.A either time that we ran the quench recovery. G. Ganetis is looking from home. [jak](#)

1:19: The yellow quench link trip looks like a failure in the link itself. Timing resolver data shows the output of the link dropping out first before anything else in this bldg. I have asked Wing to look at this to confirm it. [Ganetis](#)

1:24: It looks like a quench link system failure or a cabling fault at 10a. I have asked Wing Louie to confirm this. [Ganetis](#)

2:40: I triggered the reset quench link event (evCh.4b-evt.239) via the trigger on the permit pet page and the yellow quench link was established. [Rob](#)

7:40: The TAPE message logs show this event was triggered at 00:19 and 00:35. The EventLinkLog shows that it indeed came out at those times and a half dozen more times (presumably triggered from pet pages by others) between 00:35 and 2:30. So something had to change in the system to allow the link to recover when Rob triggered the event.

QLI Recovery / PS On Checks Commenced: (see PR-029) Delay Time: (see PR-029) minutes

Quench Analysis: Permit Module A at 1010, reset.

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Thurs-January 08 **Blue PR-027 File#** = 1073544981 **(Loc: 10a-ps3.A)** **Timestamp: 01:56:20 +1045406**

Beam Permit Fail Timestamp: Down from previous QLI.

Quench Detector(s) Trip: Running.

Dx Heaters Fired: Normal operating indications.

QPA Control / TR 1st Alarm: No faults indicated.

5 Minute: Quench Delay File: None initiated.

Beam Loss Monitors (Rads/Hr): N/A, No beam in the machine.

Main Magnet Power Status: Zero Current.

Technical Notes: **2:13:** W. Louie reported that the blue QLI occurred when Support was investigating the permit module situation in Building 1010A. [jak](#)

QLI Recovery / PS On Checks Commenced: (see PR-029)

Delay Time: (see PR-029) minutes

Quench Analysis: Trouble shooting (ref to PR-026).

Thurs-January 08 **Yellow PR-028 File#** = 1073547094 **(Loc: 10a-ps3.B)** **Timestamp: 02:31:32 +2369451**

Beam Permit Fail Timestamp: Down from previous QLI.

Quench Detector(s) Trip: Running.

QPA Control / TR 1st Alarm: No faults indicated.

5 Minute Real Quench Delay File: None initiated.

Beam Loss Monitors (Rads/Hr): N/A, No beam in the machine.

Main Magnet Power Status: Dipole = Park, Quad = zero amps.

Main Magnet Control Page: Normal conditions.

Technical Notes: **3:18:** The yellow main quad did not turn on during the quench recovery that was run at 0230. Running the quench recovery again. [jak](#)

9:47: Permit Link was in the trouble shooting state. TAPE drops the link and starts the recovery from the known state. [Louie](#)

QLI Recovery / PS On Checks Commenced: (see PR-029)

Delay Time: (see PR-029) minutes

Quench Analysis: Trouble shooting (ref to PR-026).

Thurs-January 08 **Yellow PR-029 File#** = 1073547896 **(Loc: 10a-ps3.B)** **Timestamp: 02:44:56 +860322**

Beam Permit Fail Timestamp: Down from previous QLI.

Quench Detector(s) Trip: Running.

QPA Control / TR 1st Alarm: No faults indicated.

5 Minute Real Quench Delay File: None initiated.

Beam Loss Monitors (Rads/Hr): N/A, No beam in the machine.

Main Magnet Power Status: Dipole = Park, Quad = zero amps.

Main Magnet Control Page: Normal conditions.

Technical Notes: **3:21:** The yellow quench link recovery did not bring up the yellow main quad again when the script was utilized at 0242. Carl was contacted and he had to send the reset command to the yellow quad. [jak](#)

QLI Recovery / PS On Checks Commenced: **03:14:21** Delay Time: 190 minutes

Quench Analysis: Yellow Main Quad Recovery (ref to PR-026).

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Thurs-January 08 **Blue PR-030** File#=1073548803 (Loc: 2b-ps1) **Timestamp: 03:00:00 +3874237**

Beam Permit Fail Timestamp: **03:00:00 +3874267**

Quench Detector(s) Trip: Running.

Dx Heaters Fired: Normal operating indications.

QPA Control / TR 1st Alarm: No faults indicated.

5 Minute: Quench Delay File: None initiated.

Beam Loss Monitors (Rads/Hr): N/A, No beam in the machine.

Main Magnet Power Status: Zero Current.

Technical Notes: **2:45:** Quench Link Interlock in Yellow ring, 10a-ps3.B dropped first **Sequencer**

3:00: Quench Link Interlock in Blue ring, 2b-ps1 dropped first **Sequencer**

3:00: Beam Abort, 2b-ps1 dropped Blue Quench **Sequencer**

10:23: Blue Link was in an unknown state. Manually drops the link by setting the 1002B-Bypass bit to logic low put the Permit system back to a known state. **Louie**

QLI Recovery / PS On Checks Commenced: **03:23:32**

Delay Time: 23 minutes

Quench Analysis: Node Card Software.

Thurs-January 08 **Blue PR-031** File#=1073573931 (Loc: 10a-ps3.A)

Timestamp: 09:58:48 +3739143

Beam Permit Fail Timestamp: **09:58:48 +3684153**

Quench Detector(s) Trip: (10a-qd1) B10QFQ4_6VT, Int 1, Tq= -25

Dx Heaters Fired: Normal operating indications.

QPA Control / TR 1st Alarm: No faults indicated

Postmortem Plots: Power supplies not the cause for this event.

5 Minute: Quench Delay File: (10a-qd1) B10QFQ4_6VT

Beam Loss Monitors (Rads/Hr): Sector 10 indicates multiple significant losses starting at the Abort Kicker. These losses proceed past the Dump Region thru y10-lm4 (**4698**), b10-lm4 (**4970**), g10-lm5 (**4619**), g10-lm6 (**4738**), g10-lm7 (**3618**), g10-lm8 (**1073**), g10-lm12 (**4859**), g10-lm13 (**2220**) and g10-lm20 (**4623**). These indicate that a dirty Dump had occurred in this area.

Main Magnet Power Status: Store Energy.

Qdplots: Indicates that B10QFQ4_6 signal had in fact quenched.

Technical Notes **9:50:** We have about 12×10^9 blue debunched beam and 5×10^9 in yellow. We'll try to clean some before dumping. **ad**

10:11: Well, so much about cleaning before the dump ... when the next cavity tripped the permit got pulled and blue quenched. Cryo needs to go into the ring and change a thermistor. **ad**

10:11: blue quench link trip was caused by 10a-qd1-quench detector. The quench detector tripped because of a real magnet quench at B10QFQ4_6VT. The beam permit tripped 55 msec. before the quench link. There were two real quench at b11q2 and b10q4. There was high beam loss at b10-lm4. There was moderate beam loss at g11-lm1. There is now 18 beam induced quenches for this run. **Ganetis [quench]**

QLI Recovery / PS On Checks Commenced: **10:46:09**

Delay Time: 47 minutes

Quench Analysis: Beam Induce 018

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Sat-January 10 Blue PR-032 File#=1073731358 (Loc: 10a-ps3.A) **Timestamp: 05:42:36 +2816442**
Beam Permit Fail Timestamp: **05:42:36 +2618946**
Quench Detector(s) Trip: (10a-qd1) B10QFQ4_6VT, Int 1, Tq= -25
Dx Heaters Fired: Normal operating indications.
QPA Control / TR 1st Alarm: No faults indicated
Postmortem Plots: Power supplies not the cause for this event.
5 Minute: Quench Delay File: (10a-qd1) B10QFQ4_6VT
Beam Loss Monitors (Rads/Hr): Sector 10 indicates multiple significant losses starting at the Abort Kicker. These losses proceed past the Dump Region thru y10-lm4 (**4698**), b10-lm4 (**4969**), g10-lm5 (**4253**), g10-lm6 (**3583**), g10-lm7 (**1324**), g10-lm12 (**4557**), g10-lm13 (**690**) and g10-lm20 (**1577**). These indicate that a dirty Dump had occurred in this area.
Main Magnet Power Status: Store Energy.
Qdplots: Indicates that B10QFQ4_6 signal had in fact quenched.

Technical Notes: 5:42: Dumping Beam and ramping down Sequencer
5:58: This was a real quench at B10QFQ4_6VT. The amount of debunched beam in blue at the time of the dump was approximately 4.7e9 ions. Postmortem plots below show the quench responses of the bo10-qd3, bo10-qf2, bo10-qd7 supplies. Below is also a Postmortem plot of the XFMR. It appears that the blue abort kicker fired early. jak
10:17: blue quench link trip was caused by 10a-qd1 quench detector. The quench detector tripped because of a real magnet quench at B10QFQ4_6VT. The beam permit tripped .198 sec. before the blue quench link. There was a real magnet quench at b10q4. There were high losses at b10-lm4. There are now 19 beam induced quench link trips for this run. Ganetis [quench]

QLI Recovery / PS On Checks Commenced: **06:06:01 User invoked resume(bo10-tq6-ps), 09:13:09 (User Exit)**
Delay Time: minutes

Quench Analysis: Beam Induce 019

Sun-January 11 Blue PR-033 File#=1073838366 (Loc: 10a-ps3.A) **Timestamp: 11:26:04 +2345425**
Beam Permit Fail Timestamp: **11:26:04 +2206437**
Quench Detector(s) Trip: (10a-qd1) B10QFQ4_6VT, Int 1, Tq= -25
Dx Heaters Fired: Normal operating indications.
QPA Control / TR 1st Alarm: No faults indicated
Postmortem Plots: Power supplies not the cause for this event.
5 Minute: Quench Delay File: (10a-qd1) B10QFQ4_6VT
Beam Loss Monitors (Rads/Hr): There appears to be no timestamp to collect data for this entry in the BLM Postmortems as viewed for research on January 12, 2004. (See Technical Notes comment by Ganetis for results)
Main Magnet Power Status: Store Energy.
Qdplots: Indicates that B10QFQ4_6 signal had in fact quenched.

Technical Notes:
11:25: Dumping Beam and ramping down Sequencer
11:49: Contacted Experiments at 1110 to dump the store (~4.3e9) dumped the store after Experimenters ramped down HV beam was ~5.5e9 debunched. A little too much debunched beam. BvK_
13:04: blue quench link trip was caused by 10a-qd1 quench detector. The quench detector tripped because of a real magnet quench at B10QFQ4_6VT. The beam permit tripped .139 sec. before the blue quench link. There was a real magnet quench at b10q4. There was a high loss at b10-lm4. There is now 20 beam induced quench link trips for this run. Is this high beam loss due to a problem with the abort system, is there too much de-bunched beam or are the intensities so high that a normal abort is now causing a quench ? Ganetis [quench]

QLI Recovery / PS On Checks Commenced: **01:15:02** Delay Time: 109 minutes

Quench Analysis: Beam Induce 020

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Daily Quench Analysis for the month of January 2004

Sun-January 11 **Blue PR-034 File#**=1073855913 (Loc: 6b-ps1)

Timestamp: 16:18:32 +1428655

Beam Permit Fail Timestamp: 16:18:32 +1428685

Quench Detector(s) Trip: (6b-qd1) B5QFQ2_VT, Int 1, Tq= -25

Dx Heaters Fired: Normal operating indications.

QPA Control / TR 1st Alarm: No faults indicated

Postmortem Plots: Power supplies not the cause for this event.

5 Minute: Quench Delay File: (6b-qd1) B5QFQ2_VT

Beam Loss Monitors (Rads/Hr): Highest losses appeared at b5-lm3.1 (568), g5-lm1 (1766) and b5-lm0 (1078)

Main Magnet Power Status: Ramping up, almost making Store Energy. B-dipole = 4300 amps, b-quad = 4002 amps at the time of the QLI.

Qdplots: Indicates that B5QFQ2 signal had in fact quenched.

Technical Notes: 16:14: RHIC acceleration ramp started, ramp id Au4_1073852011 Sequencer

16:18: Quench Link Interlock in Blue ring, 6b-ps1 dropped first Sequencer

16:18: Beam Abort, 6b-ps1 dropped Blue Quench Sequencer

22:46: blue quench link trip was caused by 6b-qd1 quench detector. The quench detector tripped because of a real magnet quench at B5QFQ2_VT. The beam permit tripped after the blue quench link. There was a real magnet quench at b5q2. There was a moderate beam loss at b5-lm=3.1 and g5-lm1. There is now 21 beam induced quench link trips for this run.

Ganetis [quench]

16:47: Cryo reports they want us to wait (~700 secs) before running the quench recovery. They also report a DX did fire although it doesn't show up on the Dx heater page. BvK

22:51: Cryo is wrong, there were no DX magnet quenches. What they saw was the b5q2 quench. Ganetis [quench]

QLI Recovery / PS On Checks Commenced:

Delay Time: minutes

Quench Analysis: Beam Induce 021

Mon-January 12 **Yellow PR-035 File#**=1073883665 (Loc: 4b-time.B)

Timestamp: 00:01:04 +1471914

Beam Permit Fail Timestamp: 00:01:04 +1471944

Quench Detector(s) Trip: Running.

QPA Control / TR 1st Alarm: No faults indicated.

5 Minute: Quench Delay File: None initiated.

Beam Loss Monitors (Rads/Hr): N/A, No beam in the machine.

Main Magnet Power Status: Y-dipole = 5058 amps, Y-quad = 4610 amps at the time of the QLI.

Technical Notes: Jan 12 2004 00:15: This QLI was due to the yellow main dipole. The PET page showed that the flat-dmain indicated a *Out Cur 2* fault. The Postmortem plot for the yellow d-main is below. This was not a Beam induced event. The beam had been aborted several minutes before the mains ramped. (We had to reset cfe-7a-ps2 between dumping the beam and ramping.) jak

QLI Recovery / PS On Checks Commenced: 12:29:47 (User Exit)

Delay Time: 29 minutes

Quench Analysis: Yellow Main Dipole PS, Glitch.

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Tues-January 13 **Blue PR-036 File#** = 1074027228 (Loc: 4b-time.A) **Timestamp: 15:53:48**

Tues-January 13 **Yellow PR-037 File#** = 1074027234 (Loc: 4b-time.A) **Timestamp: 15:53:52**

Beam Permit Fail Timestamp: Down prior to bringing the links down.

Quench Detector(s) Trip: No negative Tq values.

Main Magnet Power Status: MCR brought power supplies to zero current.

Technical Notes:

15:58: Brought down both links by turning b-qtrim and y-qtrim to Off once Current levels where at zero for maintenance.

heppner [rhic]

19:02: Maintenance performed: 1) Replaced bo10-th20-ps in alcove 11B. 2) Soft grounds installed on all beam permit bypass chassis. 3) PLC program modified for the Main Power Supplies. 4) New PLC programs installed in service buildings for IR supplies. heppner [rhic]

QLI Recovery / PS On Checks Commenced: **Blue = 18:39:58**

Yellow = 18:30:50

Quench Analysis: Brought down both Links for Scheduled Maintenance.
Time allocated 1600 to 2000 hours, (240 minutes).

Thurs-January 15 **Blue PR-038 File#**=1074209474 (Loc: 12a-ps1.A)

Timestamp: 18:31:12 +2540059

Beam Permit Fail Timestamp: **18:31:12 +2540088**

Quench Detector(s) Trip: (12a-qd1) B11DRDX_VT, Int 5, Tq= -23

Dx Heaters Fired: Normal operating indications.

QPA Control / TR 1st Alarm: No faults indicated, b-QD QLI BI1 1st to trip

Postmortem Plots: Indications of the power supply voltage dip down at -0.1sec. Current also separates from the Iref at this time (814 amps) as supply is ramping up. Error signal verifies that this is happening by responding negative.

5 Minute: Quench Delay File: None initiated.

Beam Loss Monitors (Rads/Hr): Good abort, Low levels in sector 11.

Main Magnet Power Status: Ramping to Store Energy. B-dipole = 2746 amps, b-quad = 2597 amps at the time of the QLI.

Qdplots: B12-DHX-PS (Raw Signal) dips in value at -0.08sec prior to the trip as the supply is still ramping.

Technical Notes:

18:28: RHIC acceleration ramp started, ramp id Au4_1074207186 [Sequencer](#)

18:31: Beam Abort, 12a-ps1.A dropped Blue Quench [Sequencer](#)

18:31: Quench Link Interlock in Blue ring, 12a-ps1.A dropped first [Sequencer](#)

18:33: Dumping Beam and ramping down [Sequencer](#)

18:49: Cryo reports seeing no elevated temperatures.

23:15: blue quench link trip was caused by the 12a-qd1quench detector. The beam permit tripped after the quench link. The quench detector tripped because of a sudden decrease in the current signal in b12-dx-ps. There were changes in the voltage signal on the postmortem plots and a small change in magnet voltage. There were no real magnet quenches. [Ganetis](#).

QLI Recovery / PS On Checks Commenced: **19:00:26 User Exit**

Delay Time: 29 minutes

Quench Analysis: b12-dhX, sudden current change tripping Quench Detector.

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Fri-January 16 ***Blue PR-039 File#***=1074243609 (Loc: 6b-ps1)

Timestamp: 04:00:08 +1452753

Beam Permit Fail Timestamp: 04:00:08 +1452753

Quench Detector(s) Trip: (6b-qd1) B5QFQ2_VT, Int 1, Tq= -24

Dx Heaters Fired: Normal operating indications.

QPA Control / TR 1st Alarm: No faults indicated, b-QD QLI BI1 1st to trip

Postmortem Plots: Indication of Opposite changes in current and voltage on bi5-qd2-ps prior to T=zero.

5 Minute: Quench Delay File: (6b-qd1) B5QFQ2_VT

Beam Loss Monitors (Rads/Hr): Minimal levels but b5-lm3.1 shows a steady increase starting at -8 seconds and peak value at **45**. g5-lm1 has a much more erratic pattern as starting at -10 seconds values range from -8 sec (**95**), -2 sec (**60**), -1 sec (**193**) and peak value of **210** at T=zero.

Main Magnet Power Status: Ramping up, almost making Store Energy. B-dipole = 4323 amps, b-quad = 4022 amps at the time of the QLI.

Qdplots: Indicates that B5QFQ2 signal had in fact quenched.

Technical Notes: **10:00:** blue quench link trip was caused by 6b-qd1 quench detector. The quench detector tripped because of a real magnet quench at B5QFQ2_VT. The beam permit tripped after the quench link. There was one real quench at b5q2. There was low beam loss at g5-lm1 of approximately 170 rads/hr that lasted for a few seconds. There were no corrector ps trips before the magnet quenched. (There were some alarms but they were due to wrong WFG readback values.) There is now 22 beam induced quenches for this run. [Ganetis](#)

QLI Recovery / PS On Checks Commenced: 04:31:27 User Invoked Cancel

Delay Time: (See PR-040)

Quench Analysis: Beam Induce 022

Fri-January 16 ***Blue PR-040 File#***=1074245377 (Loc: 10a-ps3.A)

Timestamp: 04:29:36 +1288330

Beam Permit Fail Timestamp: 04:29:36 +1288359

Quench Detector(s) Trip: All Running.

Dx Heaters Fired: Normal operating indications.

QPA Control / TR 1st Alarm: No faults indicated, bi9-qd6-qp 1st to trip.

Postmortem Plots: N/A, level to low.

5 Minute: Quench Delay File: Running

Beam Loss Monitors (Rads/Hr): No Beam at the time.

Main Magnet Power Status: Park Current.

Technical Notes: Alarm Log at 04:29:53 indicated that bi9-qd6-ps had an Error Signal, Quench then shows clear at 04:31:54.

10:10: Blue quench link trip was caused by bi9-qd6-ps when the p.s. was being turned on. The p.s. had an error fault. The Auxiliary contacts on this p.s. need to be replaced. [Ganetis](#)

QLI Recovery / PS On Checks Commenced: 04:40:24.

Delay Time: 40 minutes

Quench Analysis: bi9-qd6-ps, auxiliary contacts need replacement.

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Sat-January 17 Blue PR-041 File#=1074358744 (Loc: 10a-ps3.A) **Timestamp: 11:59:04 +111582**

Beam Permit Fail Timestamp: 11:59:03 +976802

Quench Detector(s) Trip: (10a-qd1) B10QFQ4_6VT, Int 1, Tq= -25

Dx Heaters Fired: Normal operating indications.

QPA Control / TR 1st Alarm: No faults indicated.

Postmortem Plots: N/A

5 Minute: Quench Delay File: (10a-qd1) B10QFQ4_6VT

Beam Loss Monitors (Rads/Hr): Greatest levels beyond the dump station, y10-lm4 (**4698**), b10-lm4 (**4970**), g10-lm5 (**4620**), g10-lm6 (**4793** alarm log indicated this one) and g10-lm12 (**2752**).

Main Magnet Power Status: Sitting at Store Energy.

Qdplots: Compared to similar signals, indications show that B10QFQ4_6VT signal had in fact quenched.

Technical Notes: 17:21: blue quench link trip was caused by 10a-qd1 quench detector. The quench detector tripped because of a real magnet quench at B10QFQ4_6VT. The beam permit tripped .135 sec. before the blue quench link. There was a real magnet quench at b10q4. There was a high loss at b10-lm4. There is now 23 beam induced quench link trips for this run. Is this high beam loss due to a problem with the abort system, is there too much de-bunched beam or are the intensities so high that a normal abort is now causing a quench? Ganetis

Jan 19 2004 14:34: This is a very good question George asks regularly. I have one or two perhaps relevant observations. First, I don't think there is any problem with the abort system, by which I mean, it is performing in terms of timing and kick amplitude as expected. Indeed, we are at 27kV this run (so far, yes Mei crossing fingers) which is higher than in the past (in yellow anyway). This should reduce the radiation bleed through into the downstream superconducting magnets. Second, the limited number of dumps that I have studied that occurred "on the ramp", have had clean loss patterns. These are frequently at very high intensity. As far as loss patterns are concerned, they are a nice sample of dumps with no debunched beam. Of course because we are not at store the quench margin is large and so we don't learn much about any margin in that sense. leif

MCR 11:51: Ramping RHIC in 61-bunch mode.

11:59: Blue quench of B10QFQ4_6VT. The quench occurred approximately two seconds after rebucketing. Sequencer had faulted and disappeared from the computer during the Up sequence. It is believed that when Sequencer was reopened, it was initiated from the wrong step thereby causing the rebucket sequence to run prematurely.

12:30: Cryo personnel have given permission to ramp the RHIC supplies.

12:36: Hysteresis ramp.

QLI Recovery / PS On Checks Commenced: 12:29:01 User Invoked Resume as bi9-tq4-ps still in standby, bo10-tq5-ps standby error.

Delay Time: 30 minutes

Quench Analysis: Beam Induce 023

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Daily Quench Analysis for the month of January 2004

Sat-January 17 **Blue PR-042** File#=1074369781 (Loc: 12a-ps1.A) **Timestamp: 15:03:00 +1911015**

Beam Permit Fail Timestamp: **15:03:00 +1911044**

Quench Detector(s) Trip: All tripped, positive tq values.

Dx Heaters Fired: Normal operating indications.

QPA Control / TR 1st Alarm: b12-dh0-qp 1st to trip, On, Thermal, Crowbar, Fuse, OVC and Fan.

Postmortem Plots: N/A

5 Minute: Quench Delay File: No indications of a real quench.

Beam Loss Monitors (Rads/Hr): No Beam at the time.

Main Magnet Power Status: Injection Current.

Technical Notes: **MCR 15:20:** The blue quench link recovery stalled. The b12-dh0 QPA faults have not reset. D. Bruno is being contacted.

21:12: b12-dh0-qp had a problem with its qpa controller card. First I asked CAS (Charles and Joe C) to cycle the AC power to the qpa but that did not fix the problem. I had them go ahead and swap the qpa controller card after that. This fixed the problem with b12-dh0-qp. [Don Bruno](#) [[blue](#)]

QLI Recovery / PS On Checks Commenced: **16:12:00 User Exit.**

Delay Time: (see PR-043)

Quench Analysis: b12-dh0-qpa controller card fail.

Sat-January 17 **Blue PR-043** File#=1074376266 (Loc: 10a-ps3.A) **Timestamp: 16:51:04 +2747807**

Beam Permit Fail Timestamp: **16:51:04 +2747836**

Quench Detector(s) Trip: Running.

Dx Heaters Fired: Normal operating indications.

QPA Control / TR 1st Alarm: bo10-qd7-qp 1st to trip, No faults indicated.

Postmortem Plots: N/A

5 Minute: Quench Delay File: No indications of a real quench.

Beam Loss Monitors (Rads/Hr): No Beam at the time.

Main Magnet Power Status: Park Current.

Technical Notes: **16:43:** Blue quench recovery sequence begun [tape](#)

16:51: Beam Abort, 10a-ps3.A dropped Blue Quench [Sequencer](#)

16:51: Quench Link Interlock in Blue ring, 10a-ps3.A dropped first [Sequencer](#)

17:25: blue quench link trip was caused by bo10-qd7-ps when it was turned on during quench recovery. The ps did not show an error fault. The problem could be cabling between the QPA and ps. [Ganetis](#)

17:07: The blue quench link has been recovered after two attempts at running the recovery sequence.

17:10: RHIC hysteresis ramp.

QLI Recovery / PS On Checks Commenced: **17:08:49**

Delay Time: 108 minutes

Quench Analysis: bo10-qd7ps, possible cabling between QPA and PS.

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Daily Quench Analysis for the month of January 2004

Tues-January 20 **Blue PR-044 File#=1074623035** (Loc: 10a-ps3.A) ***Timestamp: 13:23:52 +3783182***

Beam Permit Fail Timestamp: **12:09:20 +2230121**

Quench Detector(s) Trip: (10a-qd1) B9QDQ9_VT, Int 1, Tq= -24.

Dx Heaters Fired: Normal operating indications.

QPA Control / TR 1st Alarm: No Faults.

Postmortem Plots: Signal drops showing bi9-qf9-ps had been turn Off.

5 Minute: Quench Delay File: No indications of a real quench.

Beam Loss Monitors (Rads/Hr): No Beam at the time.

Main Magnet Power Status: Zero Current.

Qdplot: B9QDQ9_VT appeared noisy, this is probably cause for the quench detector to trip.

Technical Notes: Don Bruno called and said he was going to take down the link, power supply work.

QLI Recovery / PS On Checks Commenced: **14:12:50 On Checks.**

Delay Time: 49 minutes

Quench Analysis: Power Supply work, warm magnet, Don pulled the link at bi9-qf9 to off.

Tues-January 20 **Yellow PR-045 File#=1074624167** (Loc: 2b-ps1) ***Timestamp: 13:42:44 +3221763***

Beam Permit Fail Timestamp: **12:09:20 already down.**

Quench Detector(s) Trip: 10a-qd2 only one that tripped, indicating a positive Tq value.

Dx Heaters Fired: Normal operating indications.

QPA Control / TR 1st Alarm: yo9-qd9-qp 1st to fail, no faults indicated.

Postmortem Plots: N/A

5 Minute: Quench Delay File: No indications of a real quench.

Beam Loss Monitors (Rads/Hr): No Beam at the time.

Main Magnet Power Status: Zero Current.

Technical Notes: While working on the node card chassis for the new warm magnet power supplies, the yellow link went down. Even though 2b-ps1 was indicated as the first to fail, Alarm View shows the supplies time saved at 13:43:28 for blue bo10-qf8 and bo10-qd9 (OFF), bi9-qf9, bi9-q89, bo10-qf8 and bo10-qd2 (Power Supply Link Carrier). Time saved on the alarm log at 13:43:12, yo9-qf8, yo9-qd9, yi10-qf9 and yi10-q89 (OFF). These are all part of the same node card chassis and is believed that when Techs were working on the blue, this also pulled the yellow link at 10a-ps3.A.

QLI Recovery / PS On Checks Commenced: **14:21:02**

Delay Time: 38 minutes

Quench Analysis: Power supply work, warm magnet, Node card chassis that serves the blue above also services the yellow.

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Daily Quench Analysis for the month of January 2004

Tues-January 20 Blue PR-046 File#=1074627543 (Loc: 12a-ps1.A) **Timestamp: 14:39:00 +3566881**
Beam Permit Fail Timestamp: **14:39:00 +3566910**
Quench Detector(s) Trip: (12a-qd1) B12DTD_X_VT, Int 5, Tq= -23.
Dx Heaters Fired: 12a-ps2.A1 & A2, 12a-ps2-B1 & B2 all fired!
QPA Control / TR 1st Alarm: b-QD QLI BI1.
Postmortem Plots: b12-dhX-ps voltage steps down prior to T=zero.
5 Minute: Quench Delay File: (12a-qd1) B12DRDX_VT and B11DRDX_VT
Beam Loss Monitors (Rads/Hr): Minimal levels if any in sector 11 and 12..
Main Magnet Power Status: Ramping towards Store Energy, b-dipole = 3074 amps, b-quad = 2904 amps at the time of the QLI.
Qdplot: B12DRDX_VT and B11DRDX_VT both indicate a real magnet quench took place.

Technical Notes: b12-dhX-ps caused the QLI event. See next (PR-047 for details)

QLI Recovery / PS On Checks Commenced: **15:10:19** Delay Time: 31 minutes

Quench Analysis: Magnet Quench at Blue 11DHX and 12DHX, Heaters fired.

Tues-January 20 Blue PR-047 File#=1074630573 (Loc: 4b-time.A) **Timestamp: 15:29:32 +1745737**
Beam Permit Fail Timestamp: **14:39:00 down from previous QLI.**
Quench Detector(s) Trip: (4b-qd1) only one that tripped, positive Tq value.
Dx Heaters Fired: Recovering from last QLI PR-046.
QPA Control / TR 1st Alarm: b-qtrim, no faults
Postmortem Plots: N/A
5 Minute: Quench Delay File: None initiated.
Beam Loss Monitors (Rads/Hr): No beam in the machine.
Main Magnet Power Status: Park Current.
Qdplot: N/A

Technical Notes: While MCR had to wait for cryo to recover from the DX Heaters, PR-046, we were allowed to replace the internal 3 channel isolation amplifier board as this had been seen on a previous supply (b2-dhX) as a fix

QLI Recovery / PS On Checks Commenced: **16:28:53 b-qtrim standby-error, User Cancel**
Retry 16:31:55 and ending at 16:40:08 On Checks.

Delay Time: 70 minutes

Quench Analysis: Power supply work, replaced b12-dhX-ps internal 3 channel Isolation Amplifier Board.

RHIC 2003 – 2004 Physics Run

Daily Quench Analysis for the month of January 2004

Scheduled Maintenance Day, January 21, 2004

Wed--January 21 **Blue PR-048 File#** = 1074687293 (Loc: 4b-time.A) **Timestamp: 07:14:52**

Wed--January 21 **Yellow PR-049 File#** = 1074687301 (Loc: 4b-time.A) **Timestamp: 07:15:00**

Beam Permit Fail Timestamp: Down prior to bringing the links down.

Main Magnet Power Status: MCR brought power supplies to zero current.

Technical Notes:

7:20: Called MCR to ramp supplies to zero current. Once at zero currents, put b-qtrim and y-qtrim to OFF state to bring down both links for maintenance day. [Heppner \[rhic \]](#)

Systems Final Checks – Maintenance Recovery

Wed--January 21 **Yellow PR-050 File#** = 1074709688 (Loc: 8b-ps1) **Timestamp: 13:28:08**

Technical Notes: Software changes taking place.

Wed--January 21 **Yellow PR-051 File#** = 1074710823 (Loc: 6b-ps1) **Timestamp: 13:47:00**

Technical Notes: Techs were working on the Permit Module at 1006B had pulled the link to add another instrumentation T to the already existing monitoring in place.

Wed--January 21 **Blue PR-052 File#** = 1074715024 (Loc: 4b-time.B) **Timestamp: 14:57:04**

Technical Notes: **15:17:** The blue link came down because we forgot to turn on the blue main dipole PFN circuit breakers. This is for the blue quench link that occurred at 14:57. [Don Bruno](#)

Wed--January 21 **Blue PR-053 File#** = 1074715687 (Loc: 4b-time.B) **Timestamp: 15:08:04**

Technical Notes: **15:22:** The blue link came down because we forgot to turn on the blue main dipole PFN circuit breakers. [Don Bruno](#)

Jan 22 2004 10:53: These two quench link incidents (PR-052 & 053) were actually caused by troubleshooting the RegError turn-on problem in the Blue Quad. [CS](#)

Maintenance Performed: RHIC p.s. Maintenance performed today: 1) The aux contacts were swapped out for bi9-qd6-ps. 2) Corrector bi1-qs3-ps was swapped out. 3) The buffer card was swapped out for b12-dhx-ps and the wires on the insulation displacement connectors on the IGBT driver cards of b12-dhx-qp were checked and re-compressed in the connectors. 4) The signal cables between the qpa and p.s. were checked on bo10-dhx-ps and bo10-qd7-ps. 5) yi10-tq5-ps was swapped out. 6) The polarity of yo8-oct3-ps was checked and no problems were found. 7) The warm dipole p.s. yi10-th3.1-ps now accepts remote commands, this was fixed. 8) New MADC signal cables were run in all the service buildings except 4b which look at the quench signals going into the permit module. 9) Maintenance was done on the quench detection server. [Don Bruno](#). The instrumentation that had been installed on the Main Dipoles was removed. [CS](#)

QLI Recovery / PS On Checks Commenced: Blue = 15:26:51

Yellow = 14:51:36

Hysteresis Loop Finished and returned to MCR at 16:30:00

Quench Analysis: Scheduled Maintenance allocated 0700 to 1500 hours, (480 minutes).

RHIC 2003 – 2004 Physics Run

Daily Quench Analysis for the month of January 2004

Wed-January 21 Yellow PR-054 File#=1074737083

(Loc: 1b-ps1)

Timestamp: 21:04:43 +887851

Beam Permit Fail Timestamp: 21:04:43 +887881

Quench Detector(s) Trip: (1b-qd1) Y1QFA2_A1VT, Int. 20, Tq= -23

QPA Control / TR 1st Alarm:

Postmortem Plots: N/A

5 Minute: Quench Delay File: Looks like they never accepted data, indicate Running Mode.

Beam Loss Monitors (Rads/Hr): Sector 1, g1-lm18 (949), g1-lm17 (4363) and g1-lm16 (4642).

Main Magnet Power Status: Ramping to Store Energy, tripping at: Dipole = 1057 amps, Quad = 1002 amps.

Qdplots: No data available, system did not take readings.

Technical Notes: 00:45: yellow quench link trip was caused by 1b-qd1 quench detector. There was no quench detector data for this trip because of a communication problem between the quench detector FEC and the quench detector server. There were some changes in the main quad current but I cannot determine if this was the cause of the trip. The beam permit tripped after the yellow quench link. Ganetis [quench]

Jan 22 2004 10:17: The changes in the quad current are clearly from the Booster, and are always present. Since the quench detector system was not operating correctly any conclusions (or insinuations) are inappropriate. CS

QLI Recovery / PS On Checks Commenced: 23:33:26

Delay Time: 149 minutes

Quench Analysis: Data not available, Undetermined.

Wed-January 21 Blue PR-055 File#=1074737084

(Loc: 1b-ps1)

Timestamp: 21:04:44 +584643

Beam Permit Fail Timestamp: 21:04:43 +887881

Quench Detector(s) Trip: (1b-qd1) B12QFA6_A7VT, Int. 20, Tq= -23

QPA Control / TR 1st Alarm:

Postmortem Plots: N/A

5 Minute: Quench Delay File: Looks like they never accepted data, indicate Running Mode.

Beam Loss Monitors (Rads/Hr): Sector 12, g12-lm17 (169), g12-lm16 (1795) and g12-lm15 (4345).

Main Magnet Power Status: Ramping to Store Energy, tripping at: Dipole = 1068 amps, Quad = 1009 amps.

Qdplots: No data available, system did not take readings.

Technical Notes: 00:55: blue quench link trip was caused by 1b-qd1 quench detector. There was no quench detector data for this trip because of a communication problem between the quench detector FEC and the quench detector server. There were some changes in the main quad current but I cannot determine if this was the cause of the trip. The blue quench link tripped .697 sec. after the yellow quench link. The communications between the quench detector server and the FEC is restored.

Ganetis [quench]

QLI Recovery / PS On Checks Commenced: 23:25:21

Delay Time: 141 minutes

Quench Analysis: Data not available, Undetermined.

RHIC 2003 – 2004 Physics Run

Daily Quench Analysis for the month of January 2004

1 Hour Scheduled Maintenance, January 22, 2004

Thurs--January 22 **Blue PR-056 File#** = 1074788000 (Loc: 4b-time.A) **Timestamp: 11:13:20**
Thurs--January 22 **Yellow PR-057 File#** = 1074788014 (Loc: 4b-time.A) **Timestamp: 11:13:34**
Beam Permit Fail Timestamp: Down (10:55:16) prior to bringing the links down.

Technical Notes:

Cryo work in progress, window of opportunity to install the last of several “T” connections for additional monitoring and when they pulled the cables to add the “T” the links came down.

11:17: The blue link came down because we are adding signal cables to monitor the quench signals. The quench signals will be monitored by the MADC. This is being done at 1004B today. The other 5 buildings were done yesterday. [Don Bruno](#)

11:13: The yellow link down because we needed to add signal cables to monitor the quench signals. These quench signals will be monitored by the MADC. This is being done at 1004B today. The other 5 buildings were done yesterday. [Don Bruno](#)

11:54: We have finished adding the quench signals in 1004B to the MADC's. Both the blue and yellow link have been recovered and we left the power supplies at park. [Don Bruno](#)

Thurs--January 22 **Blue PR-058 File#**=1074804987 (Loc: 4b-time.B) **Timestamp: 15:56:27 +131610**

Beam Permit Fail Timestamp: 15:56:27 +131640

Quench Detector(s) Trip: All tripped, indicating positive Tq values.

Main Magnet Control Page: Blue Dipole Main – Current Monitor Fault

Postmortem Plots: N/A

5 Minute: Quench Delay File: None initiated.

Beam Loss Monitors (Rads/Hr): Sectors 9 and 10 appear as a normal dump.

Main Magnet Power Status: Store Energy.

Qdplots: N/A

Technical Notes: **15:56:** Beam Abort, 4b-time.B dropped {Blue Main PS} Quench [Sequencer](#)

15:56: Quench Link Interlock in Blue ring, 4b-time.B dropped first [Sequencer](#)

16:14: Carl is looking into a b-dmain Current Mon alarm. [PH](#)

18:26: The Blue Dipole tripped on an overcurrent on OCC SCR 1-1. The channel measured 33% higher than the other channels in the bank at flattop current; it was determined it was a slope error. This channel was recalibrated. The channel will be examined at the next maintenance day to determine the ultimate cause. [CS](#)

QLI Recovery / PS On Checks Commenced: **16:56:04**

Delay Time: 60 minutes

Quench Analysis: Blue Main Dipole, Current Monitor.

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Daily Quench Analysis for the month of January 2004

Fri-January 23 Yellow PR-059 File#=1074879744 (Loc: 8b-ps1)

Timestamp: 12:42:24 +354385

Beam Permit Fail Timestamp: 12:42:24 +320502

Quench Detector(s) Trip: (8b-qd2) Y8QFQ3_VT, Int 1, Tq= -24

Dx Heaters Fired: Normal operating indications.

QPA Control / TR 1st Alarm: No faults indicated, y-QD QLI YI1, 1st to trip

Postmortem Plots: Indication of Opposite changes in current and voltage for yo8-oct2, th2 & tv3-ps prior to T=zero.

5 Minute: Quench Delay File: (8b-qd2) Y8QFQ2_VT and Y8QFQ3_VT

Beam Loss Monitors (Rads/Hr): Most significant at b8-lm0 (**2853**), y8-lm0 (**4804**), g8-lm1 (**4448**), b8-lm3.1 (**4918**), y8-lm3.1 (**4579**), b8-lm3.2 (**4798**), b8-lm3.4-c (**558**) and b8-lm3.2-c (**3394**).

Main Magnet Power Status: Store Energy.

Qdplots: Indicates that Y8QFQ2 and Y8QFQ3 signal had in fact quenched.

Technical Notes: MCR: 12:50: Loss monitor 8b-lm3.1 pulled the permit link; a yellow QLI at 8b-ps1 followed. Ramping down. The Abort Kicker's traces indicate a yellow prefire but the supply did not trip.

13:03: Running yellow recovery script. Cryo reports nominal conditions.

13:14: yellow quench link trip was caused by 8b-qd2 quench detector. The quench detector tripped because of a real magnet quench at Y8QFQ3_VT. The beam permit tripped 34 msec. before the quench link. There were two real quench at y8q2 and y8q3. There was high beam loss at y8-lm3.1. There is now 24 beam induced quenches for this run. [Ganetis](#)

13:30: Yellow PFN module #3 leads the PFN#1 by 880ns. And rel to #1, (#2,4,5) late by (300,290,250ns). 31.5e9 ions in yellow. [Leif](#) 13:08: hello prefire my old friend! [Gjm](#)

QLI Recovery / PS On Checks Commenced: 13:12:18

Delay Time: 30 minutes

Quench Analysis: Beam Induce 024, Yellow Kicker Pre-fire.

Tues-January 27 Yellow PR-060 File#=1075230571

(Loc: 8b-ps1)

Timestamp: 14:09:31 +130680

Beam Permit Fail Timestamp: 14:09:30 +856959

Quench Detector(s) Trip: (8b-qd2) Y8QFQ2_VT, Int. 1, Tq= -24

QPA Control / TR 1st Alarm: Y-QD QLI YI1, no faults listed on qpa's.

Postmortem Plots: No power supplies of cause, yo8-oct2, yo8-th2 both indicate a quench had taken place.

5 Minute: Quench Delay File: (8b-qd2) Y8QFQ2_VT

Beam Loss Monitors (Rads/Hr): Sector 8, g8-lm1 (**2246**), y8-lm3.1 (**4579**), b8-lm3.2 (**4798**) and b8-lm3.1 (**1682**).

Main Magnet Power Status: Store Energy.

Qdplots: Indicates that y8q2 had in fact quenched.

Technical Notes: 14:09: **MCR:** Starting of a blue chromaticity/dispersion measurement, Collimators had been removed before this measurement. [TJS](#)

14:10: A suspected not change in the gap cleaner parameters before triggering ARTUS, kicked a single bunch far too many times. There is no sign of an abort misfire. [TJS](#), [DAD](#), [JLN](#), [gjm](#), [ST](#)

14:17: Cryo also sees heat. Awaiting word on recovery and ramping blue back down to park. [TJS](#)

14:34: Many curiosities with this event: Steve was taking a measurement in blue, but it was yellow losses that pulled the permit. The QLI appears coincident with the permit pull and abort, but NO BEAM appears on either abort kicker trace, as if the beam was completely gone in BOTH rings before the abort kickers fired. DCCT postmortem indicates very fast complete beam loss, consistent with a clean abort. There are many losses throughout both rings at the time of the permit pull. We'll have to think more about the exact nature of this event -- it is probably a good thing that experiments were not on. [TJS](#), [gjm](#), [JLN](#), [DAD](#)

16:38: yellow quench link trip was caused by 8b-qd2 quench detector. The quench detector tripped because of a real magnet quench at Y8QFQ2_VT. The beam permit tripped 274 msec. before the quench link. There was a real quench at y8q2. There was high beam loss at y8-lm3.1. There is now 25 beam induced quenches for this run. [Ganetis](#)

QLI Recovery / PS On Checks Commenced: 14:40:22

Delay Time: 31 minutes

Quench Analysis: Beam Induce 025.

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Daily Quench Analysis for the month of January 2004

Wed-January 28 Yellow PR-061 File#=1075266858

(Loc: 12a-ps1.A)

Timestamp: 00:14:18 +786468

Beam Permit Fail Timestamp: 00:14:18 +786497

Quench Detector(s) Trip: All with positive Tq values.

QPA Control / TR 1st Alarm: y12-q7-qp, no faults indicated.

ReadAlarmLog: y12-q7 No PS / Illegal State

Postmortem Plots: y12-q7-ps appear to have lost power, going to the off state. This in turn, affected the following supplies: y12-q6, yo12-qd3, yo12-qf2, yi11-qf3 and yi11-qf1.

5 Minute: Quench Delay File: None initiated.

Beam Loss Monitors (Rads/Hr): Sector 11 and 12 appear clean; Sector 9 Dump looks as if no beam and Sector 10 Dump indicates a clean abort.

Main Magnet Power Status: Injection Currents

Qdplots: N/A

Technical Notes: 00:14: Quench Link Interlock in Yellow ring, 12a-ps1.A dropped first Sequencer

00:20: strange yellow quench at injection without beam in the machine fp

9:46: yellow quench link trip was caused by 12-q7-ps going to the off state. This is the first time I have seen this type of fault this run. Ganetis

QLI Recovery / PS On Checks Commenced: 00:42:45

Delay Time: 29 minutes

Quench Analysis: Y12-q7-ps, loss of AC power.

Sat-January 31 Yellow PR-062 File#=1075547719

(Loc: 1b-ps1)

Timestamp: 06:15:16 +3075634

Beam Permit Fail Timestamp: 06:15:16 +3075664

Quench Detector(s) Trip: (1b-qd1) Y1QFA2_A1VT, Int. 20, Tq= -23

QPA Control / TR 1st Alarm:

Postmortem Plots: N/A

5 Minute: Quench Delay File: (5b-qd1) Y5DSA3_A2VT

Beam Loss Monitors (Rads/Hr): Most significant values found at: Sector 1, g1-lm17 (**4362**), g1-lm16 (**4642**), Sector 5, g5-lm20 (**4959**), g5-lm19 (**4659**), g5-lm18 (**4825**), g5-lm17 (**4839**), g5-lm9.2 (**3863**) and g5-lm8 (**4784**).

Main Magnet Power Status: Ramping to Store Energy, Dipole tripped at 1065 amps, Quad tripped at 1010 amps.

Qdplots: Indicates that.

Technical Notes: 6:14: RHIC acceleration ramp started, ramp id Au4_1075545281 Sequencer

06:26: Cryo reports seeing elevated temperatures in sectors 4 and 5. We are ramping down and will wait for clearance from Cryo before proceeding.

10:19: yellow quench link trip was caused by 1b-qd1 quench detector. The quench detector tripped because of a real magnet quench at Y1QFA2_A1VT. This was during the ramp up. The beam permit tripped after the yellow quench link. There were real magnet quenches in an arc quad in sector 1 and at least 1 arc dipole in sector 5. There was high beam loss at g1-lm16 and g5-lm17. What are the BLM thresholds set to at this point on the ramp? There are now 26 beam induced quench link trips for this run. More detailed analysis will be needed to see if any other magnets quenched. Ganetis [quench]

QLI Recovery / PS On Checks Commenced: 07:13:35

Delay Time: 59 minutes

Quench Analysis: Beam Induce 026.

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Daily Quench Analysis for the month of January 2004

Sat-January 31 Yellow PR-063 File#=1075553339

(Loc: 5b-ps1)

Timestamp: 07:48:56 +3066810

Beam Permit Fail Timestamp: 07:48:56 +3066841

Quench Detector(s) Trip: (5b-qd1) Y5DSA3_A2VT, Int. 5, Tq= -24

QPA Control / TR 1st Alarm:

Postmortem Plots: N/A

5 Minute: Quench Delay File: (5b-qd1) Y5DSA3_A2VT

Beam Loss Monitors (Rads/Hr): Most significant values found at: Sector 5, g5-lm20 (**4959**), g5-lm19 (**4659**), g5-lm18 (**4825**), g5-lm17 (**4839**), g5-lm9.2 (**4115**) and g5-lm8 (**4784**).

Main Magnet Power Status: Ramping to Store Energy, Dipole tripped at 1065 amps, Quad tripped at 1010 amps..

Qdplots: Indicates that.

Technical Notes: 7:47: RHIC acceleration ramp started, ramp id Au4_1075545281 Sequencer

07:49: Setup is off. A Yellow QLI and magnet quench @ Y5D5A3_A2VT occurred at transition again. Orbit correction settings will be reverted to those of the last successful ramp.

08:25: The CCR has given clearance to ramp above injection.

10:28: yellow quench link trip was caused by 5b-qd1 quench detector. The quench detector tripped because of a real magnet quench at Y5DSA3_A2VT. This was during the ramp up. The beam permit tripped after the yellow quench link. There were real magnet quenches in at least an arc dipole in sector 5. There was high beam loss at g5-lm17 g5-lm18. What are the BLM thresholds set to at this point on the ramp ? There are now 27 beam induced quench link trips for this run . More detailed analysis will be needed to see if any other magnets quenched. Ganetis [quench]

23:25: the blms in the arc are masked out until 10 sec before flattop. Since this high beam loss occurred around transition, the arc blms were not activated. Mei [quench abort]

QLI Recovery / PS On Checks Commenced: 08:10:29

Delay Time: 12 minutes

Quench Analysis: Beam Induce 027.

Sat--January 31 Blue PR-064 File#=1075555872

(Loc: 4b-time.A)

Timestamp: 08:31:12 +901444

Beam Permit Fail Timestamp: 08:31:12 +901474

Quench Detector(s) Trip: (4b-qd1) B3DSD9_5VT, Int. 100, Tq= -23

Main Magnet Control Page: Ramping down from Store Energy, Dipole tripped at 4873 amps, Quad tripped at 4462 amps.

Postmortem Plots: Indications of Iref/Current even ground currents glitch (like a ball) all prior to T=zero. Noise on the voltage signal appears to be from the booster and this is approximately 1 second before the Ball affect.

5 Minute: Quench Delay File: None initiated.

Beam Loss Monitors (Rads/Hr): Not affecting magnets sectors 3 and 4.

Main Magnet Power Status: Ramping down from Store Energy, Dipole tripped at 4873 amps, Quad tripped at 4462 amps.

Qdplots: Not indicating that a real quench to this signal had occurred.

Technical Notes:

8:38: The b-dmain shows some voltage oscillations a couple seconds before the QLI happened. The downward portion of the hysteresis ramp had just begun. Some of the supplies in 4B show the same oscillations in their error signals. JPJ

10:32: blue quench link trip was caused by 4b-qd1 quench detector. The quench detector tripped because high a signal level in B3DSA5_A4VT. This was during the down ramp. More detailed analysis will be needed to determine the cause. Ganetis [quench] When the Supplies are ramping down and if the vents open / fans come on in the building during these extreme cold days, the quench detectors produce an offset by 7-8mV. 18 + 7 mV offset = 25mV = Limit. Quench Detectors to be retuned by George Ganetis.

QLI Recovery / PS On Checks Commenced: 08:45:08

Delay Time: 16 minutes

Quench Analysis: Quench Detector Fault due to temperature change in building.